

**UNITED STATES DEPARTMENT OF COMMERCE****United States Patent and Trademark Office**Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/476,633	12/31/99	WANG	L 042390.P7832

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EXAMINER	
GARCIA, J	
ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 06/20/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

# Office Action Summary

Application No.  
09/476,633

Applicant(s)  
Wang et al

Examiner  
Joanni Adell Garcia

Art Unit  
2823



– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) ☒ Responsive to communication(s) filed on 6/15/01

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

## Disposition of Claims

4) ☒ Claim(s) 1-4 and 6-22 is/are pending in the applica

4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from considera

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-4 and 6-22 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirem

## Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some\* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_

20) ☐ Other:

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-5, 7, 9-12, 15, 18, and 19, are rejected under 35 U.S.C. 102(e) as being anticipated by Kishii et al (U.S. Patent 6,159,858).

Kishii et al discloses a method of removing a particle from a surface of a metal plug 44b formed in a via 43a comprising introducing a first agent to a W, Cu, or Al metal layer, CMP polishing the metal layer with the first agent, after polishing the metal layer, introducing a second agent comprising hydrogen peroxide to rinse the surface of the metal plug, and removing at least one particle from the surface of the metal plug. He teaches as well, that polishing the metal layer comprises polishing with the first agent having a silica abrasive material. He also teaches that introducing the second agent occurs after the operation of polishing the metal layer and the substrate. He is also disclosing polishing the substrate with the second agent. He is teaching as well, removing at least one particle from a surface of a metal plug 44b disposed over a substrate 41 comprising depositing a slurry onto a metal layer over the metal plug, polishing the metal layer, and after polishing the metal layer, rinsing the surface of the metal plug with a solution comprising hydrogen peroxide. He also teaches that rinsing the metal plug occurs after polishing the metal layer and substrate. He is teaching as well, polishing a metal layer over a conductive plug 44b

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with a slurry, after polishing the metal layer, introducing a rinsing solution onto the conductive plug, the rinsing solution comprises hydrogen peroxide. He teaches as well, further including polishing the metal layer with an abrasive material, wherein the rinsing solution is introduced after polishing of the substrate. (Figures 11C-11E, Column 4, lines 3-7, Column 9, lines 5-20, Column 10, lines 8-11, and 60, Table II, Column 13, lines 58-67, Column 14, lines 53-59).

Claims 6, 8, 13, 14, 16, 17, and 20-22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishii et al as applied to claims 1-5, 7, 9-12, 15, 18, and 19 above, and further in view of the following comment.


With regard to claims 6, 8, 13, 14, 16, 17, and 20-22, it would be a matter of routine optimization to determine a suitable polishing pressure, removal rate, and percent by volume of hydrogen peroxide to achieve the polishing and the rinsing steps of Kishii et al.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. **See MPEP 203.08.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner J. Garcia whose telephone number is (703) 306-5733. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax number for this group is (703) 308-7722 (and 7724), and (703) 305-3431 (and 3432). MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

  
George Fourson  
Primary Examiner  
Art Unit 2823

  
JAG

June 17, 2001